

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of

Atty. Docket

HOANG V. NGUYEN ET AL

NL 000730

Serial No.

Filed: CONCURRENTLY

ARRANGEMENT OF A CHEMICAL-MECHANICAL POLISHING TOOL AND
METHOD OF CHEMICAL-MECHANICAL POLISHING USING SUCH A
CHEMICAL-MECHANICAL POLISHING TOOL

Commissioner for Patents
Washington, D.C. 20231

PRELIMINARY AMENDMENT

Sir:

Prior to calculation of the filing fee and examination,
please amend the above-identified application as follows:

IN THE CLAIMS

Please amend the claims as follows:

3. Arrangement according to claim 1, characterized in that the dispensing means (7, 8) comprise a dispensing tube.
4. Arrangement according to claim 1, characterized in that the dispensing means (7, 8) comprise a dispensing tube with a plurality of closely spaced dispensing openings.
5. Arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to claim 1, characterized in that the surface on the wafer (W) is a surface of a metal layer.

8. Arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to claim 5, characterized in that the passivating agent is an oxidizing agent for the metal layer.

9. Arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to claim 5, characterized in that the passivating agent is a reagent that forms a layer of an insoluble metal salt on the metal layer.

10. Arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to claim 5, characterized in that the passivating agent is a reagent that forms a thin film coating on the metal layer, the thin film being a monolayer.

11. Arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to claim 5, characterized in that the passivating agent is a surfactant.

14. Arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to claim 5, characterized in that the etching agent is a dissolving agent for abraded metal / metal-oxide / metal salt materials.

16. Arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), further comprising rotational means for rotating the wafer holder (5) according to claim 1, characterized in that the wafer holder (5), which is connected to the rotational means, is arranged so as to rotate in a second rotational direction (ω_2).

17. Arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to claim 1, characterized in that the wafer (W)-polishing surface of the polishing pad (4) is arranged as a fixed abrasive pad, and the second dispensing means (8) dispenses the passivating agent.

18. Arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to claim 1, characterized in that the second dispensing means (8) also dispenses a small quantity of the etching agent.

22. A method to be carried out in an arrangement of a chemical-mechanical polishing tool (3) for chemical-mechanical polishing a surface on a wafer (W), according to claim 19, characterized in that the dispensing means (7, 8) comprise a dispensing tube.

23. A method to be carried out in an arrangement according to claim 19, characterized in that the dispensing means (7, 8) comprise a dispensing tube with a plurality of closely spaced dispensing openings.

24. A method to be carried out in an arrangement of a chemical-mechanical polishing tool (3) for chemical-mechanical polishing a surface on a wafer (W), according to claim 20, characterized in that the metal layer is a copper layer.

25. A method to be carried out in an arrangement of a chemical-mechanical polishing tool (3) for chemical-mechanical polishing a surface on a wafer (W), according to

claim 20, characterized in that the metal layer is a tungsten layer.

26. A method to be carried out in an arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to claim 20, characterized in that the passivating agent is an oxidizing agent for the metal layer.

27. A method to be carried out in an arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to claim 20, characterized in that the passivating agent is a reagent that forms a layer of an insoluble metal salt on the metal layer.

28. A method to be carried out in an arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to claim 20, characterized in that the passivating agent is a reagent that forms a thin film coating on the metal layer, the thin film being a monolayer.

29. A method to be carried out in an arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to claim 20, characterized in that the passivating agent is a surfactant.

32. A method to be carried out in arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to claim 20, characterized in that the etching agent is a dissolving agent for abraded metal / metal-oxide / metal salt materials.

34. A method to be carried out in arrangement of a chemical-mechanical polishing tool for chemical-mechanical

polishing a surface on a wafer (W), further comprising rotational means for rotating the wafer holder (5) according to claim 19, characterized by the following step:

to arrange the rotational means so as to rotate the wafer holder (5) in a second rotational direction (ω_2).

35. A method to be carried out by an arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to claim 19, characterized by the following steps:

- to arrange the polishing surface for polishing the wafer (W) of the polishing pad (4) as a fixed abrasive pad;
- and to dispense the passivating agent by the second dispensing means (8).

36. A method to be carried out by an arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to claim 19, characterized by the following step:

- to dispense a small quantity of the etching agent by the second dispensing means (8).

37. A method to be carried out in an arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W) according to claim 19, characterized in that the chemical-mechanical polishing treatment is used in the manufacture of a semiconductor device, the wafer (W) comprising a substrate of a semiconductor material.

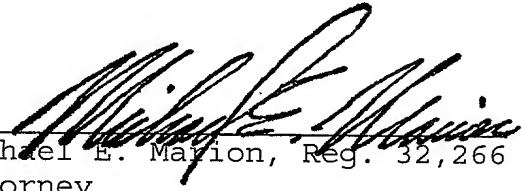
REMARKS

The foregoing amendments to claims 3-5, 8-11, 14, 16-18, 22-29, 32, 34-37 were made solely to avoid filing the claims

in the multiple dependent form so as to avoid the additional filing fee.

The claims were not amended in order to address issues of patentability and Applicant respectfully reserves all rights he may have under the Doctrine of Equivalents. Applicant furthermore reserves his right to reintroduce subject matter deleted herein at a later time during the prosecution of this application or continuing applications.

Respectfully submitted,

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APPENDIX

3. Arrangement according to claim 1 ~~any of the preceding claims~~, characterized in that the dispensing means (7, 8) comprise a dispensing tube.
4. Arrangement according to claim ~~1 or 2~~, characterized in that the dispensing means (7, 8) comprise a dispensing tube with a plurality of closely spaced dispensing openings.
5. Arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to claim 1 ~~any one of claims 1 to 4~~, characterized in that the surface on the wafer (W) is a surface of a metal layer.
8. Arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to claim 5 ~~any one of claims 5 to 7~~, characterized in that the passivating agent is an oxidizing agent for the metal layer.
9. Arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to claim 5 ~~any one of claims 5 to 7~~, characterized in that the passivating agent is a reagent that forms a layer of an insoluble metal salt on the metal layer.
10. Arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to claim 5 ~~any one of claims 5 to 7~~, characterized in that the passivating agent is a reagent that forms a thin film coating on the metal layer, the thin film being a monolayer.

11. Arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to claim 5~~any one of claims 5 to 7~~, characterized in that the passivating agent is a surfactant.

14. Arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to claim 5~~any one of claims 5 to 7~~, characterized in that the etching agent is a dissolving agent for abraded metal / metal-oxide / metal salt materials.

16. Arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), further comprising rotational means for rotating the wafer holder (5) according to claim 1~~any one of the preceding claims~~, characterized in that the wafer holder (5), which is connected to the rotational means, is arranged so as to rotate in a second rotational direction (ω_2).

17. Arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to claim 1~~any one of the preceding claims~~, characterized in that the wafer (W)-polishing surface of the polishing pad (4) is arranged as a fixed abrasive pad, and the second dispensing means (8) dispenses the passivating agent.

18. Arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to claim 1~~any one of the preceding claims~~, characterized in that the second dispensing means (8) also dispenses a small quantity of the etching agent.

22. A method to be carried out in an arrangement of a chemical-mechanical polishing tool (3) for chemical-mechanical polishing a surface on a wafer (W), according to claim 19~~any one of claims 19 to 21~~, characterized in that the dispensing means (7, 8) comprise a dispensing tube.

23. A method to be carried out in an arrangement according to claim 19~~any one of claims 19 to 21~~, characterized in that the dispensing means (7, 8) comprise a dispensing tube with a plurality of closely spaced dispensing openings.

24. A method to be carried out in an arrangement of a chemical-mechanical polishing tool (3) for chemical-mechanical polishing a surface on a wafer (W), according to claim 20~~any one of claims 20 to 23~~, characterized in that the metal layer is a copper layer.

25. A method to be carried out in an arrangement of a chemical-mechanical polishing tool (3) for chemical-mechanical polishing a surface on a wafer (W), according to claim 20~~any one of claims 20 to 23~~, characterized in that the metal layer is a tungsten layer.

26. A method to be carried out in an arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to claim 20~~any one of claims 20 to 25~~, characterized in that the passivating agent is an oxidizing agent for the metal layer.

27. A method to be carried out in an arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to claim 20~~any one of claims 20 to 25~~, characterized in that the passivating

agent is a reagent that forms a layer of an insoluble metal salt on the metal layer.

28. A method to be carried out in an arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to claim 20~~any one of claims 20 to 25~~, characterized in that the passivating agent is a reagent that forms a thin film coating on the metal layer, the thin film being a monolayer.

29. A method to be carried out in an arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to claim 20~~any one of claims 20 to 25~~, characterized in that the passivating agent is a surfactant.

32. A method to be carried out in arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to claim 20~~any one of claims 20 to 25~~, characterized in that the etching agent is a dissolving agent for abraded metal / metal-oxide / metal salt materials.

34. A method to be carried out in arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), further comprising rotational means for rotating the wafer holder (5) according to claim 19~~any one of claims 19 to 33~~, characterized by the following step:

to arrange the rotational means so as to rotate the wafer holder (5) in a second rotational direction (ω_2).

35. A method to be carried out by an arrangement of a chemical-mechanical polishing tool for chemical-mechanical

. polishing a surface on a wafer (W), according to claim 19~~any one of claims 19 to 34~~, characterized by the following steps:

- to arrange the polishing surface for polishing the wafer (W) of the polishing pad (4) as a fixed abrasive pad;
- and to dispense the passivating agent by the second dispensing means (8).

36. A method to be carried out by an arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W), according to claim 19~~any one of claims 19 to 35~~, characterized by the following step:

- to dispense a small quantity of the etching agent by the second dispensing means (8).

37. A method to be carried out in an arrangement of a chemical-mechanical polishing tool for chemical-mechanical polishing a surface on a wafer (W) according to claim 19~~any one of claims 19 to 36~~, characterized in that the chemical-mechanical polishing treatment is used in the manufacture of a semiconductor device, the wafer (W) comprising a substrate of a semiconductor material.